Practice Problems

Instructions: Complete each of the following as practice.

1. Solve each of the following linear systems using Gaussian elimination. Be sure to *give the full solution set as a set of column vectors.*

   (a) $\begin{cases} x + y + z = 3 \\ 3x - 5y + z = 0 \\ y + z = 2 \end{cases}$

   (b) $\begin{cases} x_1 + x_2 + 4x_3 + 3x_4 = 5 \\ 2x_1 + 3x_2 + x_3 - 2x_4 = 1 \\ x_1 + 2x_2 - 5x_3 + 4x_4 = 3 \end{cases}$

   (c) $\begin{cases} x + y - z = 0 \\ 2x - 3y + z = 0 \\ x - 4y + 2z = 0 \end{cases}$

   (d) $\begin{cases} 4x - 6y = 8 \\ -6x + 9y = 6 \end{cases}$

   (e) $\begin{cases} x + y - z = 0 \\ 2x + 4y - z = 0 \\ 3x + 2y + 2z = 0 \end{cases}$

   (f) $\begin{cases} x + 2y - 4z = -4 \\ 2x + 5y - 9z = -10 \\ 3x - 2y + 3z = 11 \end{cases}$

   (g) $\begin{cases} x + 2y - 3z = -1 \\ -3x + y - 2z = -7 \\ 5x + 3y - 4z = 2 \end{cases}$

   (h) $\begin{cases} x + 3y - 3z = 1 \\ 2x + 5y - 8z = 4 \\ 3x + 8y - 13z = 7 \end{cases}$

2. For further exercises, see the following (note: this list may break with future versions of these textbooks).

   (a) Beezer page 18 (problems C30 – C34)

   (b) Hefferon page 9 (problems 1.17 – 1.29, 1.37; if you're motivated, do 1.30 – 1.32, 1.34)

   (c) Matthews sections 1.2 – 1.4